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Identification of Chemical Residues . . .

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The views, opinions and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other documentation.

12a. DISTRIBUTION / AVAILABILITY STATEMENT

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12 b. DISTRIBUTION CODE

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13. ABSTRACT *(Maximum 200 words)*

Instrumentation was purchased that helps characterize the chemical structures and chemical reactions that occur when nanocrystalline metal oxides carry out destructive adsorption of chemical agents mimics. The residues (adducts) are characterized and the gases given off identified.

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14. SUBJECT TERMS

Nanoscale metal oxides, chemical agents, mimics, instrumentation

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"Identification of Chemical Agents (Mimics) Residues After Destructive Adsorption Using TPD and UV-vis-IR and Raman"

April 2001
U.S. Army Research Office

To: Army Research Office, ATTN
AMSRL-RO-RI
P.O. Box 12211
Research Triangle Park, NC 27709-2211

From: Kansas State University
Department of Chemistry
Manhattan, KS 66506

Technical Summary

Purchase of Instrumentation: DOD funds expended (shown) that were partially matched by KSU funds

(1) Quantachrome Pore Size Analyzer. ($4,290)
This instrument is used to determine, by mercury fillings of pores, pore volume, and pore size distributions of nanocrystalline materials produced in our research laboratory.

(2) GOW MAC Gas Chromatograph ($4,216)
This instrument is used to analyze gases evolved in the surface chemistry of nanoparticles interacting with toxic substances, including chemical warfare agent mimics.

(3) Spectral Instruments ($7,679)
The UV-vis spectrometer is used to characterize nanoparticle – adsorbate bonding

(4) Shimadzu TGC-GCMS ($64,819)
This combined instrumentation is used to analyze gases evolved when nanoparticle –adsorbate adducts are heated. This helps identify the type of bonding in the adduct, and how it decomposes on heating.

(5) Nicolet FT-IR and Raman ($48,996)
This instrument is used to characterize new nanoparticle formulations, and to characterize the chemical bonding in nanoparticle-adsorbate adducts. This is especially important when we use chemical warfare agent mimics as the adsorbate.